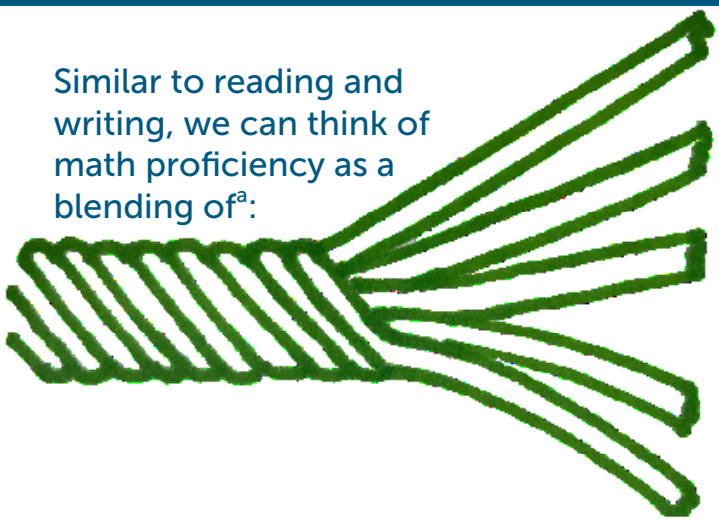
THE SCIENCE OF MATH

What is Math Proficiency?

Similar to reading and writing, we can think of math proficiency as a blending of[a]:



CONCEPTS
Understanding concepts, operations, and relations

PROCEDURES
Using procedures flexibly, accurately, and efficiently

STRATEGIES
Formulating, representing, and solving problems

REASONING
Reflecting, explaining, and justifying

DISPOSITION
Seeing math as sensible, useful, and worthwhile

To help students achieve math proficiency, teachers should[b]:

- Use a focused, coherent progression of math learning with emphasis on proficiency in key topics
- Develop conceptual understanding, procedural fluency, and problem-solving skills at the same time
- Use multiple approaches to meet the needs of students; explicit instruction should be used regularly
- Focus on proficiency with whole numbers, fractions, geometry, and measurement; these are critical for algebra
- Use formative assessment on a regular basis to assess student learning

To help *students experiencing math difficulty* with math proficiency, teachers should[c]:

1. Use explicit instruction
2. Teach clear and concise math language
3. Use concrete, pictorial, and virtual representations
4. Use number lines for learning concepts and procedures
5. Provide deliberate instruction on solving word problems
6. Use timed activities as one way to build math fluency

[a] Kilpatrick et al. (2001)
[b] National Mathematics Advisory Panel (2008)
[c] Fuchs et al. (2021)

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We provide resources related to effective math instruction. Our goal is to ensure that all students, regardless of background or status, have equitable access to math. To guide the Science of Math, we rely on well-researched instructional strategies and research about how students learn.